

Overview of the TREC-2001 Web Track (Draft for Notebook)

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Abstract

TREC-2001 saw the falling into abeyance of the Large Web Task but a strengthening and broadening of activities based on the 1.69 million page WT10g corpus. There were two tasks. The topic relevance task was like traditional TREC ad hoc but used queries taken from real web search logs from which description and narrative fields of a topic description were inferred by the topic developers. There were 50 topics. In the homepage finding task queries corresponded to the name of an entity whose home page (site entry page) was included in WT10g. The challenge in this task was to return all of the homepages at the very top of the ranking.

Cursory analysis suggests that once again, exploitation of link information did not help on the topic relevance task. By contrast, in the homepage finding task, the best performing run which did not make use of either link information or properties of the document's URL achieved only half of the mean reciprocal rank of the best run.

1 Introduction

The TREC-9 Web Track activities centred on two tasks: A Topic Relevance Task and a HomePage Finding Task. Both made use of a 10 gigabyte, 1.69 million document subset of the VLC2, distributed on five CD-ROMs as the WT10g collection. [Bailey et al. 2001].

2 Guidelines

2.1 This Year's Aims

1. To extend the utility of the WT10g Web test collection by obtaining "sufficiently complete" relevance judgements for 50 additional (correctly spelled) ad hoc (topic relevance) topics.
2. To explore a different type of retrieval task (homepage finding) for which it is known that link-based methods can be beneficial.
3. To investigate the benefit (or harm) of correctly implemented link methods on topic relevance.

Participants are welcome to explore specific Web retrieval issues, such as:

1. Can Distributed Information Retrieval techniques be used to improve retrieval effectiveness and/or efficiency?
2. How well can systems accommodate to misspelled queries. Note that the intention is that the standard query set will be correctly spelled so that we maximise the chance of finding all the relevant answers. However, if participants are sufficiently interested, we could issue a set of misspelled variants of the judged queries.

There are obviously many other interesting questions to ask about the Web data.

2.2 Dataset

The data for the TREC-9 Main Web Task is the 10 gigabyte WT10g [CSIRO 2001] collection, distributed by CSIRO. Note that this is entirely Web data. Documents include the information returned by the http daemon (enclosed in DOCHDR tags) as well as the page content. A draft paper [Bailey et al. 2001] describing the WT10g collection is available.

2.3 Web Ad Hoc Task

TREC-2001 ad hoc topics (topics 501-550) were created by NIST. They are available from the main TREC website [National Institute of Standards and Technology 1997]. They take a similar form to previous TREC Ad Hoc topics, but the topic title is a real Web query taken from search engine logs and the other fields are reverse engineered by NIST assessors. The additional fields are intended to define what the searcher wanted (but didn't fully specify) when they typed their query.

Systems are officially compared only on the basis of title-only queries, processed completely automatically. Queries using additional fields have no Web reality! However, despite this, participants were encouraged to submit additional interactive, manual and full topic statement runs to increase the discovery rate of relevant documents in the collection. As part of the automated submission process, participants were required to identify the type of each run.

Official training data (distributed by NIST) consisted of the TREC-9 topics and qrels (topics 451-500). These were directly comparable with the TREC-2001 task.

2.4 Home Page Finding Task

NIST devised a set of 145 homepage finding queries. The process involved finding a homepage within WT10g and then composing a query designed to locate it. This is a known-item search task in which each known item is the entry page to a Website. As an example, the query "Text Retrieval Conference" might be generated for the <http://trec.nist.gov/> homepage. A minimal amount of judging was required to determine if the URLs of documents returned by participants were in fact equivalent to the answer originally chosen. For example, <http://allen.rad.nd.edu:80/> and <http://rad.nd.edu/> both refer to the home page for the Notre Dame Radiation Laboratory.

Systems are compared on the basis of the rank of the first correct answer. Measures include mean reciprocal rank of first correct answer and success rate (percentage of cases in which the correct answer or equivalent URL) occurred in the first N documents.

A set of 100 queries and correct answers generated by Nick Craswell using a similar method were made available [CSIRO 2001] for training purposes.

No manual or interactive query modification was permitted in this task. There was a blanket prohibition on tuning, tweaking or altering of systems based on examining the test queries.

2.5 Indexing Restrictions

There were none. Participants were permitted to index all of each document or exclude certain fields as they wished.

2.6 Submissions and Judgments

1. All submissions were due at NIST on or before 2 August 2001.
2. An automated submission process was used which collected a small amount of information about each run.
3. No. of runs submitted/judged.
4. All judging was performed by NIST (not CSIRO) assessors.

5. Judgments in the Web Ad Hoc task (not Homepage Finding) were TERNARY (nonrelevant, relevant, highly relevant) as they were last year.
6. Judgments were made on the basis of the text within the document (only)
7. Judges were not able to follow links.

In the Topic Relevance task, 70400 documents were judged and 3363 were judged either relevant (2573) or highly relevant (790).

In the Homepage Finding task, there were a total of 252 right answers over the 145 queries, an average of 1.74 right answers per query. However, the distribution of number of right answers per query was very skewed. For 132 queries there was only one right answer but for three queries there were more than 10 right answers: query EP33 (Best Internet) - 25, query EP122 (Society for Technical Communications) - 22, and query EP139 (The Leader OnLine) - 17).

Best Internet seems to be (have been) an internet hosting company which controls a whole lot of internet domain names and presents all of them with its own homepage (prior to selling them to customers I presume). The URLs by which this page was accessible included: www.voici.com, www.avantisoft.com, www.panint.com, www.samoyed.org, www.cookiefactory.com, www.prost.org, www.bayberry.com, www.voici.com, www.biloxi-ms.com, www.globeprint.com, www.buoymedia.com, www.nm-solutions.com, www.growing.com, www.caber.com, apogee.best.com, 204.156.149.14, www.weblab.com, www.anymtnltd.com, www.romenet.com, www.spottedantelope.com, www.straw.com, www.jjsblues.com, www.jointventure.org, 204.156.144.1, www.mochinet.com, www.flick.com.

By contrast, the multiple results for the Society for Technical Communications, seem to include some spurious answers. The real home page appears to be at www.stc-va.org/display.html but lots of the others judged equivalent are subsidiary pages or homepages of individual chapters or regions of STC.

Finally, the multiple answers for the Online Leader, correspond to separate issues of an online publication. Each issue looks like a homepage but each has a specific date, eg. www.olympus.net/leader/leaderonlineoctober23961023.htm. The page which you might expect to be a homepage (www.olympus.net/leader/index.html) also has a date.

We considering URL depth to be the number of slashes in the URL after eliminating trailing slashes, we computed a histogram of the shallowest right answer for each of the queries. It turns out that 95 of the 145 shallowest answers are actually at the very top level eg. africa.cis.co.za:81, amelia.experiment.db.erau.edu, dbc113.cs.ust.hk01. Only 11 of the shallowest right answers are at a depth greater than 2.

3 Results

3.1 Topic Relevance Task

Table 1 gives details of the 77 official submissions in the title-only, automatic category of the Topic Relevance task. The best performing run fub01be2 (FUB) did not make use of links, document structure, or URL text. Features listed for that run were: no-stemming, single-word indexing, novel probabilistic term weighting model, automatic query expansion.

The second best run JuruFull (IBM-Haifa) used document structure and referring anchortext. Features listed for that run were: Vector space model, using lexical affinities, Porter stemming, slight stop-word filtering.

The best run from the third-ranked group (Ricoh) used only document content. Features listed for that run were: Probabilistic model, Query expansion, Automatic parameter value estimation

The best run from the fourth ranked group (JustSystem) made use of link information but at this stage it is unclear how. Features listed for that run were: vector space search, reference DB, pseudo-relevance feedback

In summary, it was possible to achieve top performance using document content only. Automatic query expansion was used by most of the top ranked runs. There was no clear advantage to either probabilistic or vector space approaches.

Table 2 gives details for the 20 other runs, including two manual runs. The best full-topic automatic run performed 27% better than the best title-only run. Interestingly, it made use of URL text as well as page content.

3.2 Home Page Finding Task

Table 3 gives details of all 43 official runs in the Home Page Finding task. Interestingly, the top 23 runs in this table all made use of either URLtext or links (or both). The best run which did not (IBMHOMENR) achieved an MRR score only half as high as that of the top ranked run. It made use of document structure. The highest ranked run which used content only achieved an MRR score only 30% of the best and found a right answer in the top 10 only half as often.

The performance of the top ranked run (tnout10epCAU) is quite impressive. It found a right answer in the top 10 in nearly 90% of cases. The features of this run were listed as follows: Unigram language model URL text priors (based on depth of URL-path) content run merged with seperate anchor-text run. Interestingly, a companion run which did not use anchor text scored almost as well, reflecting the importance of URL depth as a feature on this task - at least for this set of queries on this collection.

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With assistance from her colleagues at NIST, Ellen Voorhees played a major role in organising the Web track, through topic formulation, assessment, evaluation and analysis. Much of the Main Web data and many of the analyses reported here are the result of her work.

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Table 1: All official submissions in the title-only, automatic topic relevance task.

| Runid | Group | Fields | Struct. | URLtext | Links | AveP | ret(100) | ret(1000) |
|--------------|-----------------|--------|---------|---------|-------|--------|----------|-----------|
| fub01bc2 | FUB | T | - | - | - | 0.2226 | 17.38 | 46.1 |
| JuruFull | IBM-Haifa | T | Y | Y | - | 0.2105 | 17.22 | 45.6 |
| JuruFullQE | IBM-Haifa | T | Y | Y | - | 0.2091 | 16.92 | 42.6 |
| ricMM | ricoh | T | - | - | - | 0.2084 | 16.84 | 47.4 |
| ricAP | ricoh | T | - | - | - | 0.2077 | 17.62 | 49 |
| ricMS | ricoh | T | - | - | - | 0.2068 | 16.84 | 47.4 |
| JuruPruned01 | IBM-Haifa | T | Y | Y | - | 0.2066 | 17.48 | 43.1 |
| JuruPrune005 | IBM-Haifa | T | Y | Y | - | 0.2065 | 17.3 | 44.1 |
| jscbtawtl4 | Justsystem | T | Y | - | Y | 0.2060 | 16.88 | 46.9 |
| jscbtawtl3 | Justsystem | T | Y | - | Y | 0.2003 | 16.9 | 45.9 |
| Lemur | cmu-lti | T | - | - | - | 0.1985 | 17.58 | 48 |
| fub01ne2 | FUB | T | - | - | - | 0.1962 | 16.42 | 42.9 |
| jscbtawtl2 | Justsystem | T | Y | - | Y | 0.1954 | 16.3 | 45.2 |
| ok10wt3 | microsoft | T | - | Y | - | 0.1952 | 16.86 | 47.2 |
| hum01tlx | hummingbird | T | Y | - | - | 0.1949 | 16.48 | 45.8 |
| ricST | ricoh | T | - | - | - | 0.1933 | 16.2 | 46.3 |
| msrcn1 | microsoft-china | T | Y | Y | - | 0.1913 | 15.9 | 45.1 |
| ok10wt1 | microsoft | T | - | Y | - | 0.1908 | 16.78 | 46.7 |
| fub01idf | FUB | T | - | - | - | 0.1900 | 16.44 | 42.4 |
| tnout10t2 | tno/utwente | T | - | - | - | 0.1891 | 16.66 | 47.1 |
| iit01tfc | IIT | T | - | - | - | 0.1890 | 16.92 | 47.6 |
| jscbtawtl1 | Justsystem | T | Y | - | Y | 0.1890 | 15.84 | 44.6 |
| msrcn4 | microsoft-china | T | Y | Y | - | 0.1880 | 14.12 | 43.6 |
| msrcn2 | microsoft-china | T | Y | Y | Y | 0.1864 | 14.14 | 43.6 |
| fub01ne | FUB | T | - | - | - | 0.1790 | 14.98 | 41.2 |
| hum01tl | hummingbird | T | Y | - | - | 0.1784 | 15.1 | 43.7 |
| msrcn3 | microsoft-china | T | Y | Y | - | 0.1779 | 14.3 | 39.9 |
| posnir01rpt | postech | T | Y | - | - | 0.1771 | 14.7 | 42.1 |
| pir1Wt2 | cuny | T | - | - | - | 0.1742 | 15.2 | 45.5 |
| flabxt | Fujitsu | T | - | - | - | 0.1719 | 16.4 | 43.1 |
| UniNEtdL | Neuchatel | T | - | - | - | 0.1715 | 14.58 | 43.2 |
| flabxtl | Fujitsu | T | - | - | Y | 0.1705 | 16.06 | 43 |
| UniNEt7dL | Neuchatel | T | - | - | - | 0.1699 | 14.66 | 44 |
| fdut10wtc01 | Fudan | T | - | - | - | 0.1661 | 15.1 | 34.7 |
| pir1Wt1 | cuny | T | - | - | - | 0.1660 | 14.68 | 45.3 |
| UniNEtd | Neuchatel | T | - | - | - | 0.1659 | 14.34 | 43.3 |
| tnout10t1 | tno/utwente | T | - | - | - | 0.1652 | 14.62 | 43.6 |
| hum01t | hummingbird | T | Y | - | - | 0.1582 | 14.42 | 40.8 |
| apl10wc | apl-jhu | T | - | - | - | 0.1567 | 14.12 | 42.1 |
| fdut10wtl01 | Fudan | T | - | - | Y | 0.1544 | 14.56 | 34.7 |
| posnir01st | postech | T | Y | - | - | 0.1535 | 13.7 | 42 |
| posnir01pt | postech | T | Y | - | - | 0.1521 | 13.96 | 42.2 |
| iit01t | IIT | T | - | - | - | 0.1509 | 13.92 | 40.1 |
| ARCJ0 | ibm-web | T | Y | - | - | 0.1497 | 11.94 | 31.4 |
| ARCJ5 | ibm-web | T | Y | - | Y | 0.1439 | 11.88 | 31.4 |
| Merxt | IRIT | T | - | - | - | 0.1438 | 13.76 | 39.9 |
| uwmtaw2 | waterloo | T | - | - | - | 0.1420 | 13.88 | 39.9 |
| uwmtaw1 | waterloo | T | - | - | - | 0.1416 | 12.84 | 39 |
| PDWTAHDR | padova | T | - | - | - | 0.1332 | 12.74 | 37.8 |
| Ntvenx2 | nexttrieve | T | Y | - | - | 0.1313 | 11.94 | 33.3 |
| yeahtb01 | Yonsei | T | Y | - | - | 0.1287 | 12.84 | 26.8 |
| yeaht01 | Yonsei | T | Y | - | Y | 0.1286 | 12.82 | 26.7 |
| Ntvenx1 | nexttrieve | T | Y | - | - | 0.1273 | 11.76 | 35.5 |
| PDWTAHWL | padova | T | - | - | Y | 0.1209 | 11.56 | 37.8 |
| Ntvfnx3 | nexttrieve | T | Y | - | - | 0.1128 | 11.94 | 30.1 |
| ajouai0103 | ajou | T | - | - | Y | 0.1116 | 10.72 | 37.1 |
| ajouai0101 | ajou | T | - | - | - | 0.1114 | 10.74 | 37.1 |
| csi00awa1 | CSIRO | T | Y | Y | Y | 0.1085 | 10.58 | 34.3 |
| uncvsms | uncYang | T | - | - | - | 0.1069 | 12.26 | 33.4 |
| Ntvfnx4 | nexttrieve | T | Y | - | - | 0.0978 | 10.08 | 25.8 |
| uwmtaw0 | waterloo | T | - | - | - | 0.0951 | 11.3 | 27.2 |
| csi00awa3 | CSIRO | T | Y | Y | Y | 0.0946 | 10.76 | 29.8 |
| icadhoc3 | imperial | T | - | - | - | 0.0883 | 9.88 | 26.9 |
| ictweb10n | chinese-academy | T | - | - | - | 0.0860 | 9.42 | 28.5 |
| ictweb10nl | chinese-academy | T | - | - | Y | 0.0860 | 9.54 | 28.5 |
| PDWTAHPR | padova | T | - | - | - | 0.0842 | 10.14 | 36.7 |
| apl10wa | apl-jhu | T | - | - | - | 0.0805 | 9.72 | 34 |
| csi00awa2 | CSIRO | T | Y | Y | Y | 0.0789 | 9.48 | 27.9 |
| apl10wb | apl-jhu | T | - | - | - | 0.0671 | 6.96 | 12 |
| uncfsls | uncYang | T | - | - | Y | 0.0663 | 11.62 | 33.3 |
| PDWTAHTL | padova | T | - | - | Y | 0.0601 | 6.82 | 37.8 |
| icadhoc1 | imperial | T | - | - | Y | 0.0537 | 7.96 | 24.5 |
| ictweb10nf | chinese-academy | T | - | - | - | 0.0464 | 5.68 | 28.4 |
| ictweb10nfl | chinese-academy | T | - | - | Y | 0.0463 | 5.68 | 28.4 |
| icadhoc2 | imperial | T | - | - | Y | 0.0458 | 8.28 | 23 |
| irtLnut | uncNewby | T | Y | - | - | 0.0221 | 3.36 | 16.8 |
| irtLnua | uncNewby | T | Y | - | - | 0.0002 | 0.06 | 0.6 |

Table 2: All other (manual and long automatic) official submissions in the topic relevance task. Manual runs are marked with an asterisk.

| Runid | Group | Fields | Struct. | URLtext | Links | AveP | ret(100) | ret(1000) |
|-------------|-------------|--------|---------|---------|-------|--------|----------|-----------|
| iit01m* | IIT | | - | - | - | 0.3324 | 20.8 | 43.2 |
| ok10wtnd1 | microsoft | TDN | - | Y | - | 0.2831 | 22.36 | 53.8 |
| csiro0mwa1* | CSIRO | | Y | Y | Y | 0.2817 | 19.68 | 42 |
| ok10wtnd0 | microsoft | TDN | - | Y | - | 0.2512 | 20.42 | 51.7 |
| flabxtd | Fujitsu | TD | - | - | - | 0.2332 | 19.88 | 49 |
| UniNE7d | Neuchatel | TDN | - | - | - | 0.2242 | 17.52 | 48.8 |
| hum01tdlx | hummingbird | TD | Y | - | - | 0.2201 | 18.62 | 49.4 |
| kuadhoc2001 | kasetsart | TDN | - | - | - | 0.2088 | 17.7 | 44.9 |
| apl10wd | apl-jhu | TDN | - | - | - | 0.2035 | 19.56 | 50.5 |
| posnir01ptd | postech | TD | Y | - | - | 0.1877 | 17.62 | 44.5 |
| flabxtdn | Fujitsu | TDN | - | - | - | 0.1843 | 17.32 | 43.4 |
| iit01tde | IIT | TD | - | - | - | 0.1791 | 16.9 | 45 |
| Merxtd | IRIT | TD | - | - | - | 0.1729 | 15.58 | 42.4 |
| pir1Wa | cuny | TDN | - | - | - | 0.1715 | 14.88 | 45.7 |
| fdut10wac01 | Fudan | TDN | - | - | - | 0.1661 | 15.1 | 34.7 |
| uncvsmm | uncYang | TD | - | - | - | 0.1269 | 14.4 | 35.9 |
| fdut10wal01 | Fudan | TDN | - | - | Y | 0.1248 | 12.72 | 34.7 |
| yeahdb01 | Yonsei | TD | Y | - | - | 0.1094 | 11.52 | 23.5 |
| yeahtd01 | Yonsei | TD | Y | - | Y | 0.1092 | 11.48 | 23.5 |
| uncfslm | uncYang | TD | - | - | Y | 0.0781 | 13.46 | 35.8 |

Table 3: All official submissions in the homepage finding task. MRR is the mean reciprocal rank of the first correct answer. %top10 is the proportion of queries for which a right answer was found in the top 10 results. %fail is the proportion of queries in which no right answer was found in the top 100 results.

| Runid | Baseline | Group | Struct. | URLtext | Links | MRR | %top10 | %fail |
|--------------|-------------|-----------------|---------|---------|-------|-------|--------|-------|
| tnout10epCAU | tnout10epCU | tno/utwente | - | Y | Y | 0.774 | 88.3 | 4.8 |
| tnout10epCU | | tno/utwente | - | Y | - | 0.772 | 87.6 | 4.8 |
| jscbtawep2 | | Justsystem | Y | Y | Y | 0.769 | 83.4 | 9.0 |
| jscbtawep1 | | Justsystem | Y | Y | Y | 0.754 | 83.4 | 9.0 |
| jscbtawep4 | | Justsystem | Y | Y | Y | 0.752 | 83.4 | 8.3 |
| jscbtawep3 | | Justsystem | Y | Y | Y | 0.746 | 83.4 | 9.0 |
| yehp01 | yehpb01 | Yonsei | Y | Y | Y | 0.669 | 76.6 | 22.1 |
| yehpb01 | | Yonsei | Y | Y | - | 0.659 | 75.9 | 22.8 |
| UniNEep1 | IBMHOMENR | Neuchatel | - | Y | - | 0.637 | 69.0 | 8.3 |
| UniNEep2 | | Neuchatel | - | Y | - | 0.637 | 69.0 | 7.6 |
| IBMHOMER | | ibm-web | Y | - | Y | 0.611 | 77.9 | 10.3 |
| flabxeall | | Fujitsu | - | - | Y | 0.599 | 80.7 | 9.7 |
| csiro0awh2 | iit01st | CSIRO | - | - | Y | 0.593 | 71.7 | 21.4 |
| iit01stb | | IIT | Y | Y | Y | 0.578 | 66.9 | 24.8 |
| iit01st | VTBASE | IIT | Y | Y | - | 0.559 | 62.8 | 29.7 |
| UniNEep3 | | Neuchatel | - | Y | - | 0.530 | 68.3 | 6.9 |
| VTEP | msrcnp1 | VT | - | Y | Y | 0.506 | 68.3 | 15.9 |
| msrcnp2 | csiro0awh3 | microsoft-china | Y | Y | Y | 0.505 | 69.0 | 15.2 |
| csiro0awh1 | | CSIRO | Y | Y | Y | 0.498 | 72.4 | 11.0 |
| UniNEep4 | ok10whd1 | Neuchatel | - | Y | - | 0.477 | 68.3 | 11.0 |
| msrcnp1 | | microsoft-china | Y | Y | - | 0.424 | 65.5 | 13.1 |
| flabxe75a | ok10whd0 | Fujitsu | Y | Y | Y | 0.399 | 55.9 | 37.9 |
| ok10wahd1 | | microsoft | - | Y | Y | 0.387 | 64.1 | 13.1 |
| IBMHOMENR | ok10whd1 | ibm-web | Y | - | - | 0.382 | 62.1 | 11.7 |
| flabxemerge | | Fujitsu | Y | Y | Y | 0.365 | 51.0 | 33.8 |
| flabxet256 | ok10whd0 | Fujitsu | Y | - | Y | 0.363 | 50.3 | 33.8 |
| ok10wahd0 | | microsoft | - | Y | Y | 0.362 | 62.1 | 13.1 |
| ok10whd1 | ichp2 | microsoft | - | Y | - | 0.340 | 60.7 | 15.9 |
| tnout10epC | | tno/utwente | - | - | - | 0.338 | 58.6 | 18.6 |
| tnout10epA | ichp2 | tno/utwente | - | - | Y | 0.331 | 48.3 | 35.9 |
| ok10whd0 | | microsoft | - | Y | - | 0.312 | 58.6 | 15.2 |
| apl10ha | ichp2 | apl-jhu | - | - | - | 0.238 | 44.8 | 22.1 |
| ichp2 | | imperial | - | - | - | 0.237 | 44.8 | 29.7 |
| apl10hb | ichp2 | apl-jhu | - | - | - | 0.220 | 42.8 | 21.4 |
| ichp1 | | imperial | - | - | Y | 0.208 | 33.8 | 37.2 |
| kuhpf2001 | PDWTEPDR | kasetsart | - | - | - | 0.191 | 36.6 | 42.1 |
| PDWTEPDR | | padova | - | - | - | 0.189 | 33.8 | 42.8 |
| PDWTEPWL | PDWTEPDR | padova | - | - | Y | 0.178 | 30.3 | 42.8 |
| VTBASE | | VT | - | - | - | 0.126 | 24.1 | 45.5 |
| ajouai0102 | PDWTEPDR | ajou | - | - | - | 0.101 | 23.4 | 49.7 |
| ajouai0104 | | ajou | - | - | Y | 0.100 | 23.4 | 49.7 |
| PDWTEPTL | PDWTEPDR | padova | - | - | Y | 0.099 | 20.0 | 42.8 |
| PDWTEPPR | | padova | - | - | - | 0.054 | 13.1 | 44.8 |